SPRING WATERFOWL MIGRATION IN THE UINTA BASIN OF NORTHEASTERN UTAH

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ABSTRACT.— Spring waterfowl migrations at Ouray National Wildlife Refuge and Pelican Lake, Uintah County, Utah, were monitored during 1975 and 1976. Peak numbers occurred during the first week in April 1975 when 11,440 birds were counted. In 1976 the highest count, 9,650 birds, was made on 15 March. Most numerous early-season migrants were Mallards and Pintails. Important midseason migrants included Blue-winged and Cinnamon Teal, Canvasbacks, and Redheads. Late season migrants were Gadwall and Ruddy Ducks. Surveys conducted only at Ouray Refuge or at Pelican Lake would not adequately have reflected species composition of spring migration. Results point up the advisability of sampling large open water areas to obtain a representative view of waterfowl species composition in a given area during spring migration.

The Unita Basin, situated in northeastern Utah, is a structural depression lying between the Uinta Mountains to the north and the Tavaputs Plateau to the south. The basin is dissected by many streams and gulleys and the topography is broken and rough. Climate of this area is arid, with light snowfall and an average precipitation of less than 18 cm. Winters in the Uinta Basin are long and severe, with temperatures often falling below −18° C. Summers are short and cool and, although temperatures of 38° C are common, such temperatures do not last for prolonged periods.

The Green River transects the Uinta Basin from north to south and is the master stream for the entire drainage system of the basin. The Green River has long been known to serve as an important migratory route for waterfowl. From the south the main migratory routes follow the Colorado River to its junction with the Green. Waterfowl continue along the Green River through the Book Cliffs and the Uinta Mountains and then into Wyoming. To the west, the Provo River provides a passage from the western section of the Uinta Basin. Low passes through the Wasatch Mountains create routes into the Great Salt Lake drainage system (Twomey 1942).

In his paper on Colorado River Basin birds, Hayward (1967) stated that migrating waterfowl formerly depended almost entirely on the Green River and its tributaries for resting and feeding. More recently, Hayward noted, reservoirs constructed to produce electric power or for storage of irrigation waters have become important areas for migrating birds.

The purpose of this paper is to present information on the species and numbers of waterfowl migrating through the Uinta Basin and the chronology of spring migration in 1975 and 1976. Waterfowl counts were conducted at weekly intervals in 1975 and at 10-day intervals in 1976 from 5 March through 17 May. Waterfowl counts were made on Ouray National Wildlife Refuge in the southeast portion of the Uinta Basin. The 4,860 ha refuge is situated astride the Green River for 12 km. There are six separate bottoms along the length of the refuge which have been formed by ancient oxbows in the river. A system of shallow ponds and marshes has been constructed in these bottoms, and water pumped from the river fills these impoundments in the spring and fall. Vegetative zones on the refuge are components of the Mixed Desert Shrub Community (Twomey 1942). Waterfowl censuses were also made at Pelican Lake, a reservoir designed for irrigation of adjacent lands, located 1.6 km west of the refuge. This paper documents in detail the use of this newly

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created reservoir and Ouray Refuge impoundments by waterfowl of the Uinta Basin.

The migration data presented here were collected as part of a larger study of ecology of waterfowl on Ouray National Wildlife Refuge (Sangster 1976). The study was supported by the Gaylord Memorial Laboratory (School of Forestry, Fisheries and Wildlife, University of Missouri, cooperating with the Missouri Department of Conservation) and by the Missouri Cooperative Wildlife Research Unit (U.S. Fish and Wildlife Service, Wildlife Management Institute, Missouri Department of Conservation, and the University of Missouri—Columbia cooperating). The author was an Edward K. Love Fellow. I thank Leigh H. Fredrickson for guidance and criticism during this study and Thomas S. Baskett for critically reviewing this manuscript.

RESULTS

A few Canada Geese[2] and Mallards winter along the Green River as long as some open water is present. As more open water becomes available in March, ducks and geese begin moving into the Basin. In 1975 open water appeared at the edges of Pelican Lake the last week in February, and on 5 March a concentration of 2,500 ducks, mostly Mallards and Pintails, marked the beginning of spring migration. On 5 March 1975, pumps started moving water into impoundments on the refuge, and a week later over 2,000 birds were recorded using the refuge. In 1976 open water conditions were considerably different in the Uinta Basin due to prolonged cold weather. Pelican Lake was frozen except for a few small openings at the edge until 1 April, and refuge pumps did not begin filling the impoundments until April. Most of the early migrants in March 1976 were recorded on the Green River.

The spring migration peak in 1975 occurred during the first week in April when 11,440 birds were counted. In 1976 the highest count, 9,650 birds, was made on 15 March.

EARLY MIGRANTS.—Early migrants were Mallards and Pintails, which reached peak numbers during the fourth week in March 1975 and two weeks earlier in 1976 (see Table 1 for peak migration numbers and dates for all species). The peak for American Green-winged Teal was recorded the last week in March in both years, although in 1975 a second high was witnessed the second week in April. The American Wigeon, another early migrant in 1975, was most common during the third week in March. In 1976 peak numbers of wigeon occurred the second week in May. In 1975 over 75 percent of the wigeon observed were on Pelican Lake. The fact that Pelican Lake was frozen until April the following year may account for the high numbers of wigeon observed later in the season in 1976.

MIDSEASON MIGRANTS.—Midseason migrants included Blue-winged Teal, Cinnamon Teal, Canvasback, Redhead, Bufflehead, and Shoveler. Small numbers of Lesser Scaup, Common Goldeneye, Ring-necked Ducks, and Common Merganser also were present at midseason.

In 1975 peak numbers of Cinnamon Teal, Blue-winged Teal, Canvasback, Bufflehead, Ring-necked Ducks, and Common Merganser were recorded during the second week in April and the Common Goldeneye during the third week of April. In 1976 Blue-winged Teal peaked during the same period but the peaks for the other species varied. The highest numbers of Bufflehead, Ring-necked Ducks, and Common Goldeneye were recorded the fourth week in March and Canvasback and Common Merganser were most common the first week in April. Cinnamon Teal numbers remained low until 1 May 1976.

Redhead and Lesser Scaup populations were highest during the third week in April 1975. In 1976 Lesser Scaup peaked at the same period, but peak numbers of Redheads occurred the first week in April. In 1975 Shoveler populations showed two peaks, one the third week in April and the other the first week in May. The first week in May

[2]All scientific names of waterfowl according to the American Ornithologists' Union (1957, 1973) are presented in Table 1.

was also a peak period for Shoveler populations in 1976.

LATE-SEASON MIGRANTS.—The Gadwall and Ruddy Duck were late migrants to the Uinta Basin. The Gadwall and Ruddy Duck reached peak numbers the fourth week in April 1975 and the first week in May 1976. Some Gadwall were in the area as early as the end of March but the Ruddy Duck did not appear until the second week in April. Over 85 percent of all Ruddy Ducks were observed at Pelican Lake. In 1975 a total of 1,610 Ruddy Ducks were counted, but in 1976 only 178 were observed (Tables 2 and 3). Although there were two more census periods in 1975 than in 1976, this did not appear to account for the great differences in observed numbers of migrating Ruddy Ducks through the Uinta Basin.

CANADA GEESE.—Large flocks of Canada Geese do not appear to use the Green River as a migration route. In 1975 the highest concentration of geese, 265 birds, occurred on 14 March. On 15 March 1976 a peak number of 500 geese was recorded. Other weekly census figures fluctuated between 100 and 160 geese. I believe these counts represent resident geese along the Green River. Refuge records (1965–1972) show that the average peak concentrations of geese in the spring has been 180 birds. Data for 1975 and 1976 appear to be consistent with refuge records.

Band recovery information for Canada Geese banded and released at Ouray Refuge in March 1965 yielded information on the movements of 25 birds. Of the 15 birds recovered, 12 were recovered in the Uinta Basin and 3 along the lower Colorado River. Reports on 10 birds came from retrapping information at Wheatland Reservoir in southeast Wyoming. Records for geese trapped at Wheatland Reservoir during June banding operations indicate that birds using the Ouray Refuge may move to Wyoming reservoirs to molt (unpublished records, Ouray National Wildlife Refuge). Trautin and Low (1975) proposed that the harvest of geese in northeastern Utah is dependent upon out-of-state-produced birds because the ratio of out-of-state-banded birds to Utah-banded birds is 9.00:1.00. Most of the birds banded out of state have come from Wyoming, where they were banded as molting adults. The production areas that these geese came from is un-

TABLE 1. Peak numbers and the dates recorded for migrating waterfowl in 1975 and 1976. Data for Ouray National Wildlife Refuge and Pelican Lake are combined.

Species	1975 Peak Number	1975 Peak Date	1976 Peak Number	1976 Peak Date
Mallard (*Anas platyrhynchos*)	3,725	3/28	4,750	3/15
Pintail (*Anas acuta*)	4,930	3/28	4,120	3/15
Gadwall (*Anas strepera*)	1,110	4/24	285	5/1
Shoveler (*Anas clypeata*)	635	4/16	255	5/1
American Green-winged Teal (*Anas crecca*)	775	3/28	805	3/24
Cinnamon Teal (*Anas cyanoptera*)	365	4/9	225	5/1
Ruddy Duck (*Oxyura jamaicensis*)	405	4/23	80	5/1
Canada Goose (*Branta canadensis*)	265	3/14	500	3/15
Redhead (*Aythya americana*)	315	4/16	530	4/2
American Wigeon (*Anas americana*)	345	3/20	225	5/11
Bufflehead (*Bucephala albeola*)	345	4/9	215	3/24
Lesser Scaup (*Aythya affinis*)	275	4/16	300	4/21
Common Merganser (*Mergus merganser*)	330	4/9	130	4/2
Blue-winged Teal (*Anas discors*)	175	4/9	120	4/11
Canvasback (*Aythya valisineria*)	175	4/9	140	4/2
Ring-necked Duck (*Aythya collaris*)	145	4/9	215	3/24
Common Goldeneye (*Bucephala clangula*)	90	4/16	124	3/24
Snow Goose (*Chen caerulescens*)	17	3/14	---	---
Whistling Swan (*Olor columbianus*)	---	---	50	3/15

known, but the limited band recovery data from Ouray Refuge indicate that some of these out-of-state-banded birds may actually be geese produced in the Uinta Basin.

OTHER SPECIES.—On 14 March 1975, 17 Snow Geese were sighted on Pelican Lake. Snow Geese are considered rare in the Uinta Basin (Hayward 1967).

In 1976 100 Whistling Swans were recorded during four census periods in March and April. Hayward (1967) lists this species as an uncommon transient in the upper Colorado River Basin.

American Coots (*Fulica americana*) were the most abundant migrant recorded in 1975 and 1976. Peak migration levels for coots in 1975 occurred the third and fourth weeks of April, with counts of over 6,000 birds each week. In 1976 peak numbers of coots were recorded the third week in April and the second week in May, with counts of approximately 4,500 birds.

SPECIES COMPOSITION AND LOCAL DISTRIBUTION.—During spring migration, Mallards comprised 28.9 percent of the migratory population in 1975 and 33.0 percent in 1976; Pintails 25.2 percent and 27.2 percent; teal 10.8 percent and 13.3 percent; Gadwall 8.1 percent and 4.1 percent; Shovelers 6.3 percent and 2.5 percent; and Canada Geese 3.0 percent and 4.6 percent (Tables 2 and 3). Over 80 percent of the waterfowl recorded in 1975 and 1976 were dabbling ducks.

Waterfowl use of river bottom marsh and reservoir habitat was nearly equal in 1975 but species use varied widely (Table 3). The open water of Pelican Lake was used extensively for feeding and resting by diving ducks, especially Canvasbacks, Redheads, Ruddy Ducks, Bufflehead, and American Goldeneye, as well as by wigeon and coots. In 1976 the reduced use of Pelican Lake by migrating waterfowl is readily apparent (Table 3). This can be partially explained by the frozen condition of the lake throughout March and high winds in April that made the lake less attractive to migrating waterfowl. These conditions should not have affected the numbers of late arriving migrants such as Gadwall, Ruddy Ducks, Shovelers, and Buffleheads. Apparently the riparian

TABLE 2. Comparison of species composition at Ouray National Wildlife Refuge and Pelican Lake and species composition for Ouray NWR and Pelican Lake combined, spring 1975.

Species	Ouray NWR		Pelican Lake		Combined	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Mallard	7,560	33.7	6,155	24.7	13,715	28.9
Pintail	4,435	19.8	7,520	30.2	11,955	25.2
Gadwall	1,470	6.6	2,350	9.4	3,820	8.1
Shoveler	1,060	4.7	1,930	7.7	2,990	6.3
American Green-winged Teal	1,960	7.7	575	2.3	2,535	5.4
Cinnamon Teal	1,430	6.4	405	1.6	1,835	3.9
Ruddy Duck	210	0.9	1,430	5.8	1,640	3.5
Canada Goose	1,060	4.7	350	1.4	1,410	3.0
Redhead	465	2.1	880	3.5	1,345	2.8
American Wigeon	305	1.4	980	3.9	1,285	2.7
Bufflehead	310	1.4	810	3.3	1,120	2.4
Lesser Scaup	285	1.3	745	3.0	1,030	2.2
Common Merganser	970	4.3	35	0.1	1,005	2.1
Blue-winged Teal	560	2.5	140	0.6	700	1.5
Canvasback	105	0.5	300	1.2	405	0.8
Ring-necked Duck	230	1.0	150	0.6	380	0.8
Common Goldeneye	10	tr.	150	0.6	160	0.3
Snow Goose	---	---	17	0.1	17	0.1
TOTAL	22,425	100.0	24,922	100.0	47,347	100.0

TABLE 3. Comparison of species composition at Ouray National Wildlife Refuge and Pelican Lake and species composition for Ouray NWR and Pelican Lake combined, spring 1976.

Species	Ouray NWR		Pelican Lake		Combined	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Mallard	8,775	38.9	275	5.6	9,050	33.0
Pintail	6,810	30.2	665	13.5	7,475	27.2
Gadwall	885	3.9	240	4.9	1,125	4.1
Shoveler	505	2.2	170	3.5	675	2.5
American Green-winged Teal	1,685	7.5	500	10.2	2,185	8.0
Cinnamon Teal	935	4.1	75	1.5	1,010	3.7
Ruddy Duck	40	0.2	140	2.9	180	0.6
Canada Goose	1,265	5.6	1	tr.	1,265	4.6
Redhead	45	0.2	875	17.8	920	3.3
American Wigeon	510	2.3	50	1.0	560	2.0
Bufflehead	120	0.5	380	7.7	500	1.8
Lesser Scaup	20	0.1	670	13.6	690	2.5
Common Merganser	335	1.5	25	0.5	360	1.3
Blue-winged Teal	405	1.8	50	1.0	455	1.6
Canvasback	55	0.2	240	4.9	295	1.1
Ring-necked Duck	80	0.4	345	7.0	425	1.5
Common Goldeneye	---	---	215	4.4	215	0.8
Whistling Swan	100	0.4	---	---	100	0.4
TOTAL	22,570	100.0	4,916	100.0	27,485	100.0

habitat of Ouray Refuge compensated for the lack of open water on Pelican Lake for the early migrants. Mallard and pintail peaks were similar both years, but the distribution between the refuge and Pelican Lake varied (Tables 1, 2, and 3).

A migration survey only at Ouray Refuge or only at Pelican Lake would not have presented a complete picture of the species composition of the spring migration. These differences in waterfowl species distribution indicate the advisability of sampling large, open water areas to obtain the species composition of the migration population for any given area.

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